

Subject: Science

Grade: Fourth

Standard: #3 The Physical Environment

**Key Concept:** Waves, wind, water and ice shape and re-shape the earth's land surfaces by eroding rock and soil in some areas and depositing them in other areas, sometimes in seasonal layers.

**Generalization:** Moving water changes the shape of the land by erosion and deposition.

**Background:**

The students have been studying the way wind and water re-shape the Earth's surface. The following activity compares and contrasts beach and desert erosion. The teacher has assessed the student's knowledge of erosion and their ability to design an experiment. Students have been placed into groups based on the results of that assessment.

The book ***One Day in the Desert*** by Jean Craighead George, 1983, is used in this lesson. Children should work no more than 4 to a group. For each group, you will need: a large metal baking pan, sand, a pitcher, water source, pebbles (15-20, about 1 cm), ruler. This activity is adapted from Earth's Land Resources, Silver Burdett Ginn Science series.

This lesson is tiered in ***process*** according to ***readiness***.

**Tier I: *Basic/Grade Level***

Students will perform the following investigation:

Place damp sand to one side of a baking pan and make a beach. Fill the pitcher with water and slowly pour the water into the other side of the pan until the water is about 3 cm deep. Place a ruler in the water at the side opposite the "beach." Make waves by gently moving the ruler back and forth. Observe and record. Make a jetty by piling up pebbles in a line that extends from the middle of the shoreline into the water, about 5 cm. Predict what will happen to the beach if you make

the waves hit the jetty. Use the ruler again to make the waves.  
Observe and record.

Read the book, ***One Day in the Desert***. Make a Venn diagram to compare and contrast erosion at the beach and erosion in the desert.

#### Tier II: ***Advanced***

These students will perform the same activity, but after making the jetty, students should first position the ruler to make the waves move in toward the beach from the left (sand is eroded from the left side of the jetty and deposited on the right) and then the right (just the opposite). Have students determine the function of a jetty. Students will read the book, ***One Day in the Desert***. They will make a Compare and Contrast Diagram ( see Organizing Thinking, Book 2, by Howard and Sandra Black, p. 9-13, for an example of this kind of graphic organizer), to compare and contrast erosion at the beach and in the desert.

#### Assessment:

Teacher observation during group work as well as individual conversations with students serve as formative assessments. Accurate diagrams and correctly completed investigations also serve as assessments. Students should have recorded predictions, observations, results and conclusions in their science journals. These should also be used for assessment purposes.

In a large group have students share what they did and what they discovered. Have students resolve differences in observations and/or conclusions. Discuss why some groups might have had different results. Have students repeat the investigation if large inaccuracies were reported.

Have students share their comparisons of the desert and beach erosion. What inferences can students make about the two environments? Why might they have similarities? Differences?